REMARKS

STATUS OF THE CLAIMS

Claims 1-27 have been pending in the application.

Claims 4-7 and 20 are rejected under 35 U.S.C. 101 because the claimed invention is not supported by either a specific asserted utility or a well established utility.

Claim 20 does not disclose transmitting access management information, transmitting region information, transmitting access limit information.

Claims 4-7 and 20 are rejected under 35 U.S.C. 112, first paragraph.

Claims 4-7 and 20-27 are rejected under 35 U.S.C. §102(e) as being anticipated by Blumenau et al. (6,421,711).

Claims 1-3, and 8-19 are rejected under 35 U.S.C. §103(a) as being unpatentable over Blumenau et al. (6,421,711) in view of Yamada et al. (5,617,537).

According to the foregoing, the claims are amended, claims 23-25 are cancelled without disclaimer or prejudice, and thus, the claims 1-22 and 26-27 remain for reconsideration, which is respectfully requested.

No new matter has been added.

REJECTIONS

35 USC 101 and 112, FIRST PARAGRAPH, REJECTIONS:

The Office Action page 2, item 3 rejects claims 4-7 and 20 under 35 USC 101 because the claimed invention is not supported by either a specific asserted utility or a well established utility. The Office Action alleges "claim 20 does not disclose "transmitting access management information, transmitting region information, transmitting access limit information."

Claims 4-7, 20 are also rejected under 35 USC 112, first paragraph, because the claims are not supported by either a specific asserted utility or a well established utility, so one skilled in the art clearly would not know how to use the claimed invention.

According to the foregoing, claims 4 and 20, using claim 4 as an example, are amended to clarify that the claimed present invention provides a utility of:

4.   (CURRENTLY AMENDED) Host computers, ...

each ~~of said host computers~~host computer comprising:

an integrated management mechanism ~~integrating and managing~~to integrate and manage the ~~storage area network system~~SAN according to a process comprising:

obtaining access route information of the host computers and the storage devices;

setting up a storage affinity for each host, a switch zoning affinity for each switch, and a host affinity for each storage device, as a SAN configuration setting information based on said obtained access route information;

transmitting access management information to the storage devices and to storage area network management mechanisms of the host computers, based upon the set storage affinity for a host computer;

transmitting region information to region-setting mechanisms of the switches, based upon the set switch zoning affinity; and

transmitting access limit information concerning the host computers to storage management mechanisms of the storage devices, based upon the set host affinity for a storage device.

A meaning of the present on Application page 11, lines 9-13 is as follows.

(1)   The system administrator sets up the region 415 to the SAN integrated management mechanism 500, where the region 415 is in the storage 410 that is attempted to be accessed from the host 110.

(2)   The system administrator sets up the FCA (fiber channel adapter) 411 and the HBA (host bus adapter) 111 to the SAN integrated management mechanism 500, where the FCA and the HBA are used when accessing the storage 410.

A meaning of the present Application page 5, lines 18-22 is as follows.

(1)   The system administrator sets up the region to the SAN integrated management mechanism 1, where the region is in the storage 4 that is attempted to be accessed from the host 2.

(2)   The system administrator sets up the FCA (fiber channel adapter) and the HBA (host bus adapter) to the SAN integrated management mechanism 1, where the FCA and the HBA are used when accessing the storage 2.

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Therefore, the present Application enables one skilled in the art to use the claimed present invention according to 35 USC 112, first paragraph, and the claimed present invention has a utility according to 35 USC 101.

Further, independent claims 5 and 6 are directed to a "switch" and a "storage device" that are able to be integrated and controlled by the claimed present invention's "*integrated management mechanism*" 1, 500.

For example, the claimed present invention, as recited in amended independent claim 5, provides:

> 5. (CURRENTLY AMENDED) ~~Switches~~A switch in a storage area network system (SAN) including storage devices, host computers, and an integrated management mechanism integrating and managing the ~~storage area network system~~SAN, ~~each of said switches~~said switch comprising:
>
> *a region-setting mechanism carrying out storage device region access path settings,* according to a process comprising: ~~within the storage devices~~
>
> *receiving storage device region access path information, from the integrated management mechanism,* and
>
> *setting access path information to a storage device region,* based on the storage device region ~~information concerning regions within the storage devices transmitted by~~access path settings received from the integrated management ~~mechanisms~~mechanism,
>
> *wherein said ~~switches interconnecting~~switch communicatively interconnects the storage devices and the host computers according to the setting of the access path information according to the integrated management mechanism.*

For example, the present Application page 14, lines 10-17, FIG. 5(c) and FIG. 3 (e.g., Access Path 600) support independent claim 5. Therefore, claim 5 provides an enabling utility of providing "~~Switches~~*A switch* ... *wherein said ~~switches interconnecting~~switch communicatively interconnects the storage devices and the host computers according to the setting of the access path information according to the integrated management mechanism.*"

Amended independent claim 6 provides:

> 6. (CURRENTLY AMENDED) ~~Storage devices~~A

storage device in a storage area network system (SAN) including host computers and switches that interconnect the host computers and the storage device, and an integrated management mechanism integrating and managing the storage area network system, each of said storage devicesdevice comprising:

a storage management mechanism establishingto establish conditions of access restrictions for the storage device according to a process comprising:

receiving storage device access restriction information, from the integrated management mechanism, and

establishing an access restriction condition to the storage device based on the storage device access restriction information transmitted by the integrated management mechanism, said switches interconnecting the host computers and the storage devices.

For example, the present Application page 14, lines 18-27; FIG. 5(d) and FIG. 3 (e.g., storage management mechanism 418); and page 15, starting at line 2 and FIG. 7, support independent claim 6. Therefore, claim 6 provides an enabling utility of providing "Storage devicesA storage device ... *establishing an access restriction condition to the storage device* based on the storage device access restriction information transmitted by the integrated management mechanism, said switches interconnecting the host computers and the storage devices."

Therefore, the present Application enables one skilled in the art to use the claimed present invention according to 35 USC 112, first paragraph, and the claimed present invention has a utility according to 35 USC 101.

Withdrawal of the rejections under 35 USC 112, first paragraph, and 35 USC 101 is respectfully requested.

35 USC 102 and 103 REJECTIONS

Claims 20-27 and 4-7 are rejected under 35 USC 102(e) as being anticipated by Blumenau (US Patent No. 6,421,711). In the previous Office Action these claims were rejected as being anticipated by Nolan.

Claims 1-3 and 8-19 are rejected under 35 USC 103(a) as being unpatentable over Blumenau in view of Yamada (US Patent No. 5,617,537). Yamada is newly cited, and, thus, newly relied upon. In the 2nd previous Office Action McCormack and Blumenau were used to reject claims 1-3 and 8-19 under 35 USC 103(a).

Therefore, the independent claims 1, 4, 5, 6, 7, 8, 9, 15, 16, 17, and 20 are rejected based upon Blumenau and Yamada.

In rejecting independent claim 1, the Office Action page 6, last paragraph, alleges "it was well known ... access management information (i.e., control information), access right and region information (i.e., area address) could be transferred, copy as request" and appears to support the well known assertion by Yamada, Nishimura and Driscoll.

The Office Action page 6 relies on Blumenau column 42, lines 20-30, which discusses:

> From the above, it is seen that a number of facilities have described to provide various features and advantages in a data processing system having a large number of hosts networked to one or more cached storage subsystems, some or all of which could be desired or required by any particular system users and managers. It should be apparent to a person of ordinary skill in the data processing art that the embodiments described above can be constructed to meet some or all of the following requirements:
>
> A. General Requirements
>
> 1. Any number of storage subsystems should be simply plugged into the network and easily configured by a system administrator for host access to selected volumes.
>
> 2. Each entity in the data processing system (storage subsystem, data network, and host) should have separate and distinct management interfaces. *The system administrator graphical user interface, or host graphical user interface, may provide a point of integration for the management interfaces of the entities.*

The Office Action relies on the Blumenau discussion "*The system administrator graphical user interface, or host graphical user interface, may provide a point of integration for the management interfaces of the entities*," hence alleging it would be obvious or well known to provide the claimed present invention's "*integrated management mechanism*" 1, 500 (FIGS. 1-3 of the present Application) "*transmitting access management information*," "*transmitting region information*," and "*transmitting access restriction information*." The Office Action relies on Yamada, Nishimura and Driscoll for discussing message transmission, hence alleging the claimed present invention's "*transmission*" of storage area network (SAN) management information would be obvious.

However, according to the claimed present invention when, for example, a system administrator sets up the access paths in a storage area network (SAN) as illustrated in FIG. 5a, the claimed present invention's integrated manager (1, 500) analyzes the access paths set by

the system administrator to establish or set up a storage affinity (FIG. 5b), a switch zoning (FIG. 5c) and a host affinity (FIG. 5d). Accordingly, the integrated manager (1, 500) holds the SAN configuration status or secures the SAN configuration status based upon the SAN access paths set up by the system administrator. Support for the claimed present invention can be found in the present Application, for example, in page 5, line 18 to page 6, line 20; and page 11, line 9 to page 13, line 10. The benefits of the claimed present invention are discussed in page 6, line 18 to page 9, line 4, such as troubleshooting or restoration due to SAN component (e.g., host, storage device, switch, etc.) replacement/maintenance.

According to the foregoing, the Application page 6, line 1 is corrected as follows: "Then, the ~~system administrator~~integrated management mechanism 1 establishes the zoning for the switch ...," in view of page 5, lines 18-22 and page 5, lines 23-24. See also, the present Application FIGS. 5 and 6.

The independent claims 1, 7, 8, 9, 15, 16, 17, and 20, using claim 1 as an example, are amended along the lines of setting up the tables illustrated in FIGS. 5(b), (c) and 5(d), for example, based upon SAN access paths setup by a system administrator, and operations of FIG. 6, as follows:

      1.   (CURRENTLY AMENDED) A storage area network (SAN) management system comprising:

         host computers, each comprising a storage area network management mechanism;

         storage devices, each comprising a storage management mechanism;

         switches coupled to the host computers and to the storage devices, said switches interconnecting the host computers and the storage devices, each of the switches comprising a region-setting mechanism; and

         an integrated management mechanism to manage the SAN according to a process comprising:

            ~~integrating and controlling the storage area network, said integrated management mechanism including~~obtaining access route information of the host computers and the storage devices~~; and~~;

            setting up a storage affinity for each host, a switch zoning affinity for each switch, and a host affinity for each storage device, as a SAN configuration setting information based on said obtained access route information~~,~~;

            transmitting access management information to the

storage devices and to the storage area network management mechanisms of the host computers, based upon the set storage affinity for a host computer;

transmitting region information to the region-setting mechanisms of the switches, based upon the set switch zoning affinity; and

transmitting access limit information concerning the host computers to the storage management mechanisms of the storage devices, based upon the set host affinity for a storage device.

2. (CURRENTLY AMENDED) The storage area network management system as in claim 1, wherein the integrated management mechanism obtainingobtains a configuration status of the storage area network from each of the storage devices, the switches, and the host computers and stores said configuration status as the storage area network configuration settings information, and wherein at regular intervals, or when instructed by a system administrator, the integrated management mechanism gathers current configuration status of the storage area network, compares the current configuration status to the configuration settings information that was collected, and detects discrepancies based upon the comparison.

Independent claim 4 is directed to a host comprising "an integrated management mechanism," which is amended along the lines of amendments to the independent claim 1.

Further, independent claims 7 and 20 (see also, dependent claim 27) are amended to clarify that transmission of the SAN configuration setting information by the integrated management mechanism can be any combination of one or more of access management, region or access limit information, as supported by the present Application FIG. 6 and page 13, lines 5-10. A benefit of the claimed present invention is to accommodate SAN devices that do not support host affinity, zoning, or storage affinity.

It is readily apparent Blumenau and Yamada fail to disclose or suggest the claimed present invention:

1. (CURRENTLY AMENDED) A storage area network (SAN) management system comprising:

...

an integrated management mechanism to manage the SAN according to a process comprising:

obtaining access route information of the host

computers and the storage devices; and,

   setting up a storage affinity for each host, a switch zoning affinity for each switch, and a host affinity for each storage device, as *a SAN configuration setting information* based on said <u>obtained</u> access route information;

   transmitting access management information to the storage devices and <u>to</u> the storage area network management mechanisms of the host computers, ***based upon the set storage affinity for a host computer***,

   transmitting region information to the region-setting mechanisms of the switches, ***based upon the set switch zoning affinity***, and

   transmitting access limit information concerning the host computers to the storage management mechanisms of the storage devices, ***based upon the set host affinity for a storage device***.

In view of the claim amendments and remarks withdrawal of the rejections of pending claims and allowance of pending claim is respectfully requested.
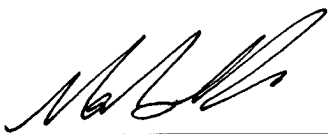
CONCLUSION

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

      Respectfully submitted,
      STAAS & HALSEY LLP

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